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APPEAL BRIEF

Appellant	:	Dennis L. Keiser
App. No	:	10/694,198
Filed	:	October 27, 2003
For	:	SYSTEM FOR TESTING MUSCULAR POWER
Examiner	:	Jonathan M. Foreman
Art Unit	:	3736

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Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In accordance with the Notice of Appeal filed May 4, 2009, Appellant hereby submit this Appeal Brief and the required fee pursuant to 37 C.F.R. § 41.37.

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

TABLE OF CONTENTS

	Page No.
I. JURISDICTION	3
II. REAL PARTY IN INTEREST.....	3
III. RELATED APPEALS AND INTERFERENCES.....	3
IV. STATUS OF CLAIMS	3
V. STATUS OF AMENDMENTS	3
VI. SUMMARY OF CLAIMED SUBJECT MATTER.....	4
VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL	6
VIII. ARGUMENT	6
A. The Examiner erred by rejecting Claims 1, 2, 8, 9, and 13-15 under 35 U.S.C. §102(e) as being anticipated by <i>Warner</i>	6
B. The Examiner erred by rejecting Claims 1, 5, 8, and 9 Under 35 U.S.C. §103(a) as being unpatentable over <i>MacFarlane</i> in view of <i>Brock</i>	10
IX. CONCLUSION.....	13
X. CLAIMS APPENDIX.....	14
XI. EVIDENCE APPENDIX.....	16
XII. RELATED PROCEEDINGS APPENDIX.....	17

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

I. JURISDICTION

The Honorable Board of Patent Appeals and Interferences has jurisdiction over this appeal pursuant to 35 U.S.C. § 6(b). This Appeal is in response to the Final Office Action dated February 4, 2009. The Notice of Appeal in response to this Office Action was filed on May 4, 2009. This Appeal Brief is being timely filed today, August 4, 2009, with a one-month extension.

II. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of this application, Keiser Corporation.

III. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences.

IV. STATUS OF CLAIMS

Claims 1-9 and 13-15 are pending in this application. Claims 10-12 were withdrawn in a Response to Restriction Requirement filed on October 30, 2006. Claims 13-15 were added in an Amendment filed on February 29, 2008. Accordingly, Claims 1-9 and 13-15 remain pending in the present application and are at issue in this Appeal. All of the pending claims are rejected under a variety of grounds as detailed below. The claims are attached hereto in the Claims Appendix.

V. STATUS OF AMENDMENTS

Appellant has made several amendments to the claims during the course of prosecution, and the Examiner has entered all of Appellant's amendments to the claims. No amendments were filed subsequent to the Final Office Action issued February 4, 2009.

VI. SUMMARY OF CLAIMED SUBJECT MATTER

The independent claim subject to this appeal is Claim 1. The subject matter of independent Claim 1 generally relate to a method of evaluating the power produced a muscle group of a person, and more particularly to a method that can be used for evaluating maximum power generated by a muscle group when moving against a plurality of different levels of resistance. (*See* Application, paragraph [0022]).

Appellant has found that conventional methods of using exercise equipment have concentrated on measuring the strength of a muscle or muscle group (e.g., measuring the amount of weight that can be lifted). (*See id.*, paragraph [0005]). However, strength alone does not accurately represent the performance of muscles. A person's muscles may be able to lift an adequate amount of weight, but may be too slow to be useful for many purposes. (*See id.*). For example, an athlete putting the shot at a track and field contest must have the strength to easily move the sixteen-pound shot; however, the strength must be coupled with sufficient speed to cause the shot to be propelled with enough velocity to travel the needed distance. (*See id.*). In contrast, some activities require the ability to move very heavy objects at much lower velocities. (*See id.*).

A more meaningful measurement of the performance of a person's muscles is a measurement of power (e.g., a measurement of the force applied by the muscles times the velocity of the movement). (*See id.*, paragraph [0006]). However, because of the structure of most appendages in a person's body, the speed of an exercise stroke will vary throughout the stroke as the appendage varies from full extension to full contraction and the leverage of the muscles against the moving portion of the appendage changes. (*See id.*).

Embodiments of the invention address these problems by determining the force and velocity at which the maximum power is delivered. (*See id.*, paragraph [0007]). In particular, the inventive method measures pressure in pneumatic cylinders and the position of the pistons within the pneumatic cylinders to determine the velocity of movement against the resistive force throughout an exercise stroke and to thereby determine the power of the user throughout an exercise stroke. (*See id.*, paragraph [0066]). By performing a series of such measurements over

a range of resistance forces, the user's maximum power as a function of force is determined. (*See id.*). Armed with the information regarding the user's power capabilities, a trainer, a therapist, or the user can tailor exercises to the user's capabilities and the user's goals. (*See id.*).

With reference to aspects of the exemplary embodiments discussed above, the subject matter of independent Claim 1 is summarized below.

Independent Claim 1

Independent Claim 1 recites: A method of evaluating the power of a muscle group of a person, comprising:

initializing a resistance element to a first resistance level (*see, e.g., id.*, paragraphs [0008], [0084], [0087], [0093], [0094], [0095] and Figure 8);

moving an engagement assembly coupled to the resistance element at a highest achievable velocity through an exercise stroke (*see, e.g., id.*, paragraphs [0090], [0114]-[0118] and Figure 11);

measuring a representative velocity at which the engagement assembly is moved through the exercise stroke and collecting data responsive to the representative velocity (*see, e.g., id.*, paragraphs [0074], [0078], [0107] and Figures 7 and 11);

increasing the resistance level of the resistance element (*see, e.g., id.*, paragraphs [0084], [0092], [0093], [0094], [0095] and Figure 8);

repeating the acts of moving, measuring and increasing until sufficient data are collected (*see, e.g., id.*, paragraphs [0097], [0099] and Figure 8);

calculating power for each exercise stroke based on the resistance level for each exercise stroke and the representative velocity for each exercise stroke (*see, e.g., id.*, paragraphs [0078], [0080], [0110] and Figure 11);

generating an output that represents at least the measured velocity and calculated power for a plurality of exercise strokes (*see, e.g., id.*, paragraphs [0080], [0109], [0110], [0112], [0113] and Figure 11); and

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

determining a maximum power for the muscle group (*see, e.g., id.*, paragraph [0084] and Figures 8 and 11).

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- 1) Whether Claims 1, 2, 8, 9, and 13-15 are anticipated under 35 U.S.C. 102(e) by U.S. Patent Application Publication No. 2002/0086774 to *Warner*, et al. ("*Warner*").
- 2) Whether Claims 1, 5, 8, and 9 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 6,672,157 to *MacFarlane* et al. ("*MacFarlane*") in view of U.S. Patent No. 6,231,481 to Brock ("*Brock*").

VIII. ARGUMENT

Appellant provides the following arguments in support of the patentability of Claims 1-9 and 13-15.

A. The Examiner erred by rejecting Claims 1, 2, 8, 9, and 13-15 under 35 U.S.C. §102(e) as being anticipated by *Warner*.

The Examiner rejected independent Claim 1 and dependent Claims 2, 8, 9, and 13-15 under 35 U.S.C. §102(e) as being anticipated by *Warner*. In addition, dependent Claims 3, 4, and 7 were rejected as being unpatentable under 35 U.S.C. §103(a) over *Warner* in view of U.S. Patent No. 4,846,466 to Stima III (*Stima III*) and/or further in view of U.S. Patent No. 4,730,829 to Carlson (*Carlson*). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1 recites, among other limitation, "moving an engagement assembly coupled to the resistance element at a highest achievable velocity through an exercise stroke." The method requires a user to attain "a highest achievable velocity" over a series of increasing resistance

levels. By only attaining “a highest achievable velocity” of the engagement assembly can the method subsequently determine “a maximum power for the muscle group” as also recited in Claim 1. *Warner* does not disclose at least these steps.

To support the rejection the Examiner cites to *Warner* and states, “The Examiner considers the highest velocity recorded during the exercise set to be the highest achievable velocity through an exercise stroke in that it was the highest velocity achieved.” (*See* Office Action dated February 4, 2009, p. 7). In other words, a user of the *Warner* system may achieve a velocity during a first repetition that is different than the velocity achieved during a second repetition. However, just because the two velocities are different does not mean that either velocity is the highest achievable velocity. The method recited in Claim 1 requires the user to attain their “highest achievable velocity,” not merely a velocity that is higher than another velocity. Nowhere does *Warner* disclose that the user will attain “a highest achievable velocity” as recited in Claim 1.

Warner not only does not disclose attaining “a highest achievable velocity,” but actually teaches away from the cited limitation. *Warner* is directed to a data logger and pacing system for a repetitive-motion machine. (*See Warner*, paragraph [0033], emphasis added). The system paces an athlete’s workout by dynamically monitoring the pace of repetitions and warning the user if the pace deviates from the pre-programmed routine. As explained in *Warner*, the first processing step performed by the system is to calculate a pacing interval based on the number of repetitions and the max time allowed for the set. (*See id.*, paragraph [0293]). Thus the system knows how many repetitions the user is supposed to do before a given set is completed. Based on sensor input, the system can tell the user to go slower or faster. (*See id.*, paragraph [0040]). The system uses tones to pace the user in the weight room by indicating a too slow or too fast pace. (*See id.*, paragraph [0042]). For too fast of a pace, the system broadcasts a tone representing a “too fast” condition. (*See id.*, paragraph [0296] and block 251 of Figure 10). Thus, the system in *Warner* is designed to ensure a user maintains a constant pace during a workout. Such a system is the antithesis of the method described in Claim 1 which requires the user to attain “a highest achievable velocity.”

Because a user of the system in *Warner* does not attain a “highest achievable velocity,” *Warner* can not determine “a maximum power for the muscle group” as also recited in Claim 1. The Examiner cited to the determination of a “power peak 600” in *Warner* as corresponding to the claimed “maximum power.” However, the peak power is not the “maximum power for the muscle group.” The “maximum power” recited in Claim 1 is determined from a user performing repetitions over increasing resistance levels and at highest achievable velocities. For the same reason that the different velocities achieved by a user of the *Warner* system are not the highest achievable velocity, the “power peak” in *Warner* is also not a “maximum power for the muscle group” as the phrase is used in Claim 1. *Warner* is consistent with Appellant’s interpretation in that the value is called a “peak power,” not a maximum power.

Further, without “determining a maximum power for the muscle group,” the *Warner* system fails as a diagnostic tool as described in Appellant’s specification. Determining a user’s power over a range of resistance levels allows (1) a trainer or therapist to tailor exercises to the user’s capabilities and goals; (2) evaluation of aspiring athletes with respect to anticipated power requirements for their activity; and (3) a comparison of a user’s results with norms of persons in the user’s population. The system in *Warner* does not provide these same advantages.

As explained in Appellant’s specification and illustrated in Figure 11, the described method can be advantageously used to determine the resistance level and velocity where a person has the greatest power. Figure 11 shows four continuous graphs with each graph representing plots of discrete data points. In general, the velocity graphs 1110, 1120 show that the maximum velocities occur at very low forces. In general, the power graphs 1130, 1140 start at relatively low values at the lower resistance levels. Since the amount of force is very low, the power is low. As the resistance level increases, the power increases generally steadily until the power reaches a maximum magnitude. As the resistance level continues to increase, the velocity continues to decrease and the power also decreases. Generally, the maximum power for the muscle group is not achieved at very low forces or very high forces but somewhere between the two. Appellant’s Claim 1, not *Warner*, can be used to identify the velocity and force that corresponds to the maximum power.

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

From the graphs in Appellant's Figure 11, it can also be seen that the power reaches a maximum magnitude for different forces and velocities for the user's left arm and the user's right arm for the illustrated measurement sequence. A conditioning program can be developed to improve the symmetry of the user by tailoring the program based on the power differences between the left and right arms.

The described method can also be used to gather data to develop graphs of the power of successful athletes and persons in other professions requiring physical ability to determine the resistance levels where such athletes and other persons produce the most power. This information can be advantageously used to evaluate aspiring athletes and other persons to determine how they compare to the anticipated power requirements for their activities. Armed with the information thus obtained, the person can develop a training program to properly condition the muscles to obtain the desired results.

Inherency

While not the basis for the rejections, the Examiner notes that "under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device." (See Office Action dated February 4, 2009, p. 7, citation omitted). However, the Examiner provides no factual evidence to satisfy this contention of inherency as is required. See M.P.E.P. § 2112. Moreover, the Examiner has incorrectly applied the principle of inherency.

Inherency does not even exist when a missing claim element is very likely, though not necessarily, present in a prior art reference. "To establish inherency, the extrinsic evidence 'ust make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

One of ordinary skill in the art would not necessarily recognize or wish to perform the claimed method. Further, there is no motivation for a user to perform the claimed method steps unless taught to do so by some other reference. In fact, Appellant's specification is the only reference teaching the motivation to attain "a highest achievable velocity" of the engagement assembly to subsequently determine "a maximum power for the muscle group."

The Examiner has not, and indeed cannot, argue that any one of the applied references inherently discloses the claimed method. For example, the system in *Warner* is designed to ensure a user maintains a constant pace during a workout. By maintaining a constant pace, one using the system of *Warner* would not inherently attain "a highest achievable velocity." As discussed above, an assertion of "inherency" requires specific factual support showing that the method limitation is necessarily present in the prior art and that it would be recognized. The Examiner has presented no factual support, and has not satisfied his burden.

Thus, Appellant respectfully submits that at least the limitations recited above are not disclosed under the doctrine of inherency or otherwise in the *Warner* reference. Accordingly, the *Warner* reference can not anticipate Claim 1.

Claims 2-9 and 13-15 depend from independent Claim 1 and thus include at least all the limitations of Claim 1. Therefore, Appellant respectfully requests the reversal of the rejection of Claims 1-9 and 13-15.

B. The Examiner erred by rejecting Claims 1, 5, 8, and 9 Under 35 U.S.C. §103(a) as being unpatentable over *MacFarlane* in view of *Brock*

The Examiner has rejected Claims 1, 5, 8, and 9 under 35 U.S.C. §103(a) as being unpatentable over *MacFarlane* in view of *Brock*. The Examiner bears the initial burden to establish and support a *prima facie* case of obviousness. *In re Rinehart*, 531 F.2d 1048, 189 U.S.P.Q. 143 (C.C.P.A. 1976). To establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A. 1974). Additionally, to establish a *prima facie* case of obviousness, some reason, either in the references or in the knowledge generally available among those of ordinary skill in

the art, to modify or combine the elements should be provided by the Examiner. *KSR Int'l v. Teleflex*, 127 U.S. 1727 at 1741 (2007).

From *MacFarlane*, the Examiner relied upon a combination of testing performed with a isotonic machine/power tester 10 (*See MacFarlane*, col. 11 line 13 to col. 12, line 11) and test results from a summary (*See id.*, col. 10, line 50-57) for disclosing all of the limitations of Claim 1 except for the “generating an output” limitation. The Examiner admitted that *MacFarlane* fails to disclose generating an output that represents at least the measured velocity and calculated power for a plurality of exercise strokes as recited in Claim 1. However, *Brock* was relied upon for disclosing the “generating an output” limitation.

MacFarlane discloses a portable power tester 10 for determining muscular power (*See id.*, Figures 4 and 5). However, the power tester 10 described in Example 1 does not “mov[e] an engagement assembly coupled to the resistance element at a highest achievable velocity through an exercise stroke” or “determin[e] a maximum power for the muscle group.”

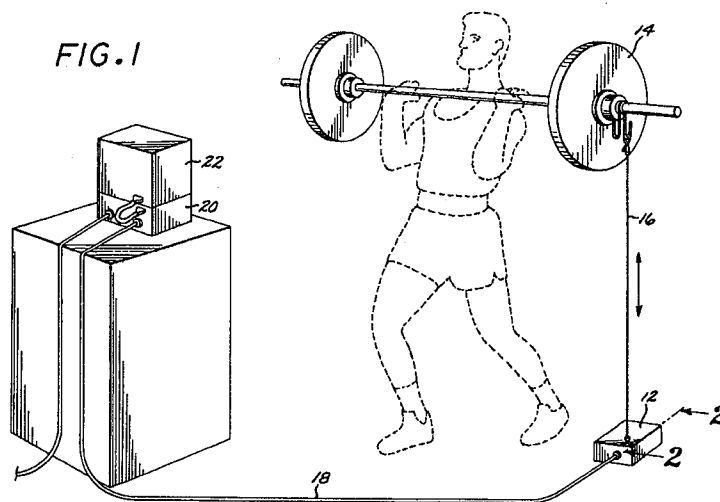
Example 1 from *MacFarlane* provides a comparison between power measurements for test subjects that used an isokinetic machine, a vertical jump machine, and an isotonic machine. Each of the three machines was used to separately determine a power for each subject. The power measurements were then compared in the summary (*See id.*, col. 10, line 50 to col. 10, line 65).

The isotonic testing described in column 11 does not identify a maximum velocity at which the maximum power is achieved for a muscle group. *MacFarlane* states, “For each resistance (60, 70, 80% 1Repetition Maximum), the right leg was tested three times then the left leg was tested three times.” (emphasis added). While the velocity of one of the three repetitions at each resistance level may be higher than the other two, it likely will not be “a highest achievable velocity” for that resistance level as recited in Claim 1 since *MacFarlane* as with *Warner* does not mention measuring a maximum value or appreciate the advantage of measuring such a value. Thus, while isotonic testing with the power tester 10 of *MacFarlane* measures time and distance to calculate velocity for each of the nine repetitions of a single leg, nowhere does *MacFarlane* mention achieving a highest achievable velocity as recited in Appellant’s Claim 1.

Further, the “maximum measured power tester 10 power” described in the summary for all three machines (*See id.*, col. 10, line 50 to col. 10, line 65) can not be “a maximum power for the muscle group” as recited in Claim 1 since the three repetitions performed at each of the three resistance levels do not achieve “a highest achievable velocity” as explained above. One can determine from *MacFarlane*’s data which of the three or nine repetitions performed by a test subject results in the highest power value, but that power value is not “a maximum power for the muscle group.” Rather, *MacFarlane*’s highest power value is merely the highest value of the three or nine repetitions. This “highest value” is not the same as a maximum power for a muscle group since the speeds in *MacFarlane* are not “a highest achievable velocity.”

Thus, nowhere does *MacFarlane* describe “moving an engagement assembly coupled to the resistance element at a highest achievable velocity through an exercise stroke” and “determining a maximum power for the muscle group.” At least these elements are not disclosed or taught in *MacFarlane*. *Brock* does not cure these deficiencies in *MacFarlane*.

The Examiner identified the reason why “it would have been obvious to one having ordinary skill in the art at the time the invention was made to include generating an output that represents at least the measured velocity and calculated power for a plurality of exercise strokes as taught by *Brock* with the method disclosed by *MacFarlane* et al. in order to assist a user in maximizing or optimizing his efforts.” (*See* Office Action dated February 4, 2009, p. 4). Appellant respectfully disagrees on this point as well.



Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

Brock discloses a device (above) that measures the power generated by a person and displays the power to the person in real time. A user of the system in *Brock* can try to increase his or her displayed peak power. However, the purported reason of "maximizing or optimizing his efforts" taken from *Brock* is unrelated to the purpose of the testing program cited in *MacFarlane*. The testing program in *MacFarlane* is intended to validate the accuracy of the power tester 10 on different machines. Accordingly, it would not have been obvious to one having ordinary skill in the art at the time the invention was made to combine *Brock* with *MacFarlane* as proposed by the Examiner.

Claims 5, 8, and 9 depend from independent Claim 1 and thus include at least all the limitations of Claim 1. Therefore, Appellant respectfully requests the reversal of the rejection of Claims 1, 5, 8, and 9 under 35 U.S.C. §103(a) as being unpatentable over *MacFarlane* in view of *Brock*.

IX. CONCLUSION

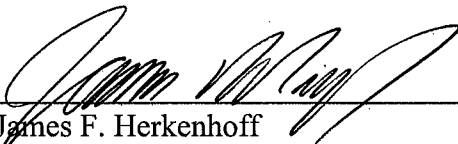
For the reasons discussed above, Appellant respectfully requests that the Honorable Board reverse all of the outstanding rejections of the pending claims. The undersigned may be contacted at the telephone number provided below with any questions regarding this application.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: August 4, 2009



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X. CLAIMS APPENDIX

1. A method of evaluating the power of a muscle group of a person, comprising:
initializing a resistance element to a first resistance level;
moving an engagement assembly coupled to the resistance element at a highest achievable velocity through an exercise stroke;
measuring a representative velocity at which the engagement assembly is moved through the exercise stroke and collecting data responsive to the representative velocity;
increasing the resistance level of the resistance element;
repeating the acts of moving, measuring and increasing until sufficient data are collected;
calculating power for each exercise stroke based on the resistance level for each exercise stroke and the representative velocity for each exercise stroke;
generating an output that represents at least the measured velocity and calculated power for a plurality of exercise strokes; and
determining a maximum power for the muscle group.
2. The method as defined in Claim 1, further including determining a velocity and a resistance level where the maximum power is produced.
3. The method as defined in Claim 1, wherein the resistance element is a pneumatic cylinder in which the engagement assembly causes a piston within the pneumatic cylinder to move against air pressure in the pneumatic cylinder.
4. The method as defined in Claim 1, wherein the engagement assembly is configured as a chest press, and wherein a first handgrip is provided for a left hand of a subject and a second handgrip is provided for a right hand of a subject, each handgrip being coupled to a respective resistance element, the act of measuring being performed independently for each handgrip to provide an independent power measurement for each arm of the subject.
5. The method as defined in Claim 1, wherein the time between the act of measuring selectively increases as the resistance level increases to enable the muscle group to rest between successive acts of moving the engagement assembly.

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

6. The method as defined in Claim 3, wherein the velocity is determined by periodically measuring a position of the piston, and the velocity is calculated based on the distance moved during a known time interval.

7. The method as defined in Claim 1, wherein sufficient data are collected when the resistance level is sufficient to preclude moving the engagement assembly through a complete exercise stroke.

8. The method as defined in Claim 1, wherein sufficient data are collected when the resistance level is incremented to a predetermined level.

9. The method as defined in Claim 1, wherein sufficient data are collected when a predetermined number of exercise strokes are completed.

10. (Canceled).

11. (Canceled).

12. (Canceled).

13. The method as defined in Claim 1, wherein the step of repeating the acts of moving, measuring and increasing comprises increasing the resistance level to a maximum resistance, and wherein the step of calculating power involves calculating a power at the maximum resistance.

14. The method as defined in Claim 1 further including determining a maximum velocity at which the engagement assembly is moved during a plurality of exercise strokes.

15. The method as defined in Claim 1, wherein the resistance element provides a generally consistent resistance against movement of the engagement assembly throughout the exercise stroke.

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

XI. EVIDENCE APPENDIX

None.

Docket No. : KEISER.020A
Application No. : 10/694,198
Filing Date : October 27, 2003

Customer No.: 20,995

XII. RELATED PROCEEDINGS APPENDIX

None.

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